

A TRIP TO THE RICHMOND RIVER DISTRICT.

PART I.—GENERAL AND BOTANICAL.

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THE Richmond River is situated in the extreme north-east corner of New South Wales, its mouth being not more than 30 miles south of the Tweed, which forms part of the boundary between New South Wales and Queensland. From the Clarence River, which is still further south, to the Tweed is the district known to naturalists as being the southern limit of Australian tropical and semi-tropical vegetation and bird-life. The territory comprising the Clarence, the Richmond, and the Tweed River districts is a coastal region, and is subject to the tropical rainy season, setting in about the end of January. There is no great width of territory, for the Great Dividing Range is less than a hundred miles from the coast. Rivers flowing east, therefore, would be expected to be rapid and with a short course, but it is not so with the three under notice, for they wind about in the rich alluvial flats as broad streams navigable to coasting steamers for many miles of their courses. Notice particularly the Richmond: from the township of Lismore, which is situated inland at the junction of two creeks, the distance to the mouth by following the stream's course is quite 70 miles, whereas by taking the road it is only 22 miles. The two creeks, Wilson's and Leycester, coming in from the north and north-west respectively and uniting at Lismore, form a stream of about 60 yards in width, when it takes the name of the Richmond.

On the upper reaches of this river are the belts of tropical vegetation known as the "Big Scrub," which extend over to the Macpherson Range. It was during the months of December and January I visited these scrubs, and I have prepared a sketch of my trip in this paper. Leaving Melbourne by steamer on a Saturday afternoon (the 4th December, 1897), I reached Sydney on the Monday evening. The same night I had expected to tranship to a coasting steamer bound northward, but owing to unfavourable weather I found a vessel would not sail until the following Thursday. In the meantime I enjoyed the various sights of Sydney. One morning I went across to Manly and along the back beach to the Quarantine Ground, where I found the local little bird, *Origma rubricata*, or Rock-Warbler, at home. On the summit of the cliffs and among the heather and out-cropping sandstone rocks quite a number of these birds were twittering sweetly in the morning sun. They are very nimble little creatures, and run along the rocks and through the stunted vegetation with great swiftness. I was fortunate in securing a pair of birds, but could find no traces of nesting operations.

After leaving Sydney in the *Tomki*, a twin-screw steamer of 400 tons, we had a very rough time at sea, but by Saturday morning we were outside the Richmond Heads. The entrance to the river is protected from the sands by two long and massive stone breakwaters, but the bar sometimes silts up to a remarkable extent, and often the steamers are delayed through not being able to cross. The entrance, too, is very narrow, and a tug-boat is needed to keep our steamer's head in the right direction. One vessel, the *Lismore*, some years ago attempted to cross in rough weather, and was driven on shore a little to the north. Her remains are still seen on the sands. About a mile from the entrance is the town of Ballina, and we are now on a splendid sheet of water between mangrove-lined banks, for the Richmond here must be 500 yards in width. From Ballina the river takes a long sweep to the south, and after passing several beautiful islets, some in midstream, we stop to unload cargo at the Broadwater Sugar Mills. This establishment is the only one of its kind in the district, and to it is sent all the cane grown along the river. The cane is conveyed on barges, which are moored, until ready to be unloaded, under a large shed built over the water's edge. We passed several tugs coming down stream with as many as three and four of these cane-laden barges in tow.

Leaving Broadwater the river takes another great turn to the northward. Several townships have sprung up along the river's course; our steamer stops at each place unloading cargo, provisions, &c., receiving produce on the return trip to convey to Sydney. Habitations, each with its area planted in cane or maize, are scattered along both sides of the river. A steam launch is occasionally seen moving from one plantation to another, conveying goods to and from the larger wharves. One launch I noticed was fitted out as a general store, no doubt going its round once a week.

The township of Curaki is a place of some importance. It is situated at the junction of the two arms of the Richmond. One branch, called the Casino arm, goes away to the north-west past the town of Casino, while the other is the north arm, along which we steam towards Lismore. The river now is much narrower, and has a very winding course, so much so that every now and again our steamer has to slacken speed to round the sharp curves. The country on either side consists of rich alluvial flats, one time well timbered with gum trees, but now studded with plantations of cane, maize, and in some places arrowroot, while in the stretches used as pasture the dry rung timber is left standing. Making our way up stream, however, we pass an occasional patch of semi-tropical vegetation, the first reminder that we are nearing the "Big Scrub." Soon after coming in sight of the outskirts of Lismore we stop awhile at the wharf of the New South Wales

Butter Company, where some hundreds of empty butter boxes are unloaded. The factory is one of the largest, perhaps, in Australia, and the shipping companies undertake to carry back free of charge one new empty for every full butter box conveyed as cargo. The Lismore wharf is in the heart of the town, and being Sunday morning all was quiet as we proceeded to our berth. Exactly 24 hours had been occupied in traversing the distance of 70 miles from the mouth of the river.

Lismore is apparently a thriving town, prettily situated on undulating ground between the hills and the river. The newer portion has spread across the stream, and a railway has recently been opened by Byron Bay towards the Tweed River, a distance of some 40 miles. I expected to be met at Lismore by my friend Mr. W. T. Bailey, but there was no appearance of him, so the next morning, after making inquiries, I was directed to his place at Cowlong, about 10 miles distant, and set out on foot. It was a lovely morning. I took the main road to Ballina, which after leaving Lismore rises abruptly on to the crest of the hills, and thence for a considerable distance runs along the series of ridges forming the eastern watershed of Wilson's Creek. The outlook is really beautiful, and on a clear morning the Macpherson Range, terminating in Mount Danger, is distinctly visible beyond the undulating hills which intervene, while in the foreground is occasionally caught the gleam from the water of the river below. The road leads past splendid maize crops, while patches of arrow-root and bananas are seen around every habitation. The timber is still eucalyptus, with very little undergrowth. It is surprising to see what a hold the imported plant *Lantana* has got; by the roadside in places it is a compact barrier, and where it has been allowed a free hand the growth is well nigh impenetrable. When I had traversed about five miles I caught sight of a patch of darker green vegetation ahead, which proved to be another outlying clump of "Big Scrub," for after passing through it the road was again in forest country. It is remarkable to see how abruptly the two classes of vegetation meet. But I notice that the undergrowth is becoming denser and taller, and the myrtle tree is now seen among it. The gum trees also are finer and more vigorous looking, for they are now growing in the rich red soil which makes the "Big Scrub" territory so luxuriant. Before reaching Mr. Bailey's place I had passed from the gum tree, or forest country, as it is called, into the "Big Scrub" proper. Cowlong appears to be out of touch to a certain extent with civilization, for a telegram I had despatched from Sydney six days previously had not arrived. It came by post the following Wednesday. After bringing my baggage out from Lismore, I was comfortably installed through the generous hospitality of a neighbour, Mr. J. M'Lean.

The next day I was exploring the scrub, where I found things

of course very different to Victoria, and at first I did not feel at home with the prickly undergrowth and twining creepers which were everywhere in evidence. But that same day I was enabled to see such glorious birds as the Rifle and the Regent in their true home. The "Big Scrub" grows in a rich red soil, the main tract extending from Lismore on the south to the Macpherson Range on the north, and the whole of the country is a delightful series of hills and hollows, with creeks and watercourses in abundance. But the scrub is now falling fast before the selector's axe, and dairy cattle in great numbers are thriving upon the rich pastures which take its place. The scrub-clearing is necessarily very heavy work, for the vegetation is so dense and luxuriant. The cutting of the undergrowth and the tree-felling are usually done during the early winter months, and then about December or January, if a good fire is sent through, all except the larger logs are burnt. There is no anxiety about bush fires in this country; the scrub is so moist that even the fiercest of the clearing fires will not penetrate more than six or eight yards into the green vegetation. After clearing the land the next operation is to form the pasture, and while in this embryo state every care is taken to keep down undesirable grasses. A grass the farmers of the Richmond have found most valuable for dairy stock is *Paspalum dilitatum*, the seed of which is sown profusely. Some have a bed of this grass set apart for seed purposes alone.

Dairy farming is one of the foremost of the thriving industries of New South Wales. Certainly the Richmond district attests the fact, for herds of 75 and 100 milking cattle are not uncommon. Throughout the district are the necessary adjuncts to the industry, the separating stations or "creameries," which in their turn feed the central butter factory at Lismore. Good grass and therefore good feed for cattle are available all the year round. Really the dry season is in winter time, for the tropical rains coming about the end of January create a deluge for three months, while in the spring and early summer previous to the downfalls extremely heavy dews settle every night. I was unfortunate during my trip, for the rains came very early—on Christmas Day—and I was treated to four solid weeks of wet weather out of the seven I spent in the district. The tropical shower is no joke, for the water comes down in bulk, and after each is over the pasture, the scrub, the road, everything is water striving to get away, racing down the hillsides and along the depressions at tip-top speed, forming watercourses in places previously dry, and filling creeks, even the river itself, to overflowing. The showers, sometimes accompanied by thunder, follow one another in quick succession. All may look bright, with a few scudding clouds, when lo! up comes a black bank to deluge the face of the land. Each shower as it approaches makes a great noise and is heard

some distance off, especially when crossing a maize field, for the hard leaves resound as the rain clatters on them. Several times I ventured out with my gun, but only to be drenched and find water to wade through on the way back. If overtaken by a shower while in the scrub I could hear the rattle on the tree tops long before the drops reached me below. To prolong the agony greater drops continued to fall from the thick foliage long after the rain had ceased. Sometimes, however, there is a lull for a day or two, and at such times when the sun is shining the moist "muggy" heat is very discomforting. Perspiration rolls from one with the slightest exertion. But as soon as the sun goes down it becomes cool, and the nights are very pleasant.

With the advent of the rains all vegetation grows amazingly, weeds spring up in the plantations and threaten to choke any tender crop, the fruit of the plantains begins to ripen, and pine-apples and melons fill to bursting with moisture. The red soil is very sticky; no farm implement will keep clean when working, for the earth will adhere to anything. For this reason, too, the low-lying parts of unmetalled roads are very heavy; the soil in the wheel-tracks works up to the consistency of putty. One place is locally called the "Gluepot" during the rainy season.

Several introduced plants flourish wild in the district. In abandoned clearings the Ink-weed, *Phytolacca*, grows quickly. The Lantana, mentioned before, although chiefly along the roadside, has spread in places and robbed the farmer of his ground. Three other plants to be found in a wild state are of more service. The blackberry, the edible passion fruit, and the Cape gooseberry grow and fruit luxuriantly on the cleared ground. It is quite a treat on a warm day to come across a passion fruit vine growing over a log or trailing up among the second growth of scrub, and to enjoy its luscious fruit.

At Wollongbar, on the main road from Lismore to Ballina, the Government have established an experimental or "model" farm. Tropical and semi-tropical plants of any commercial value are grown. Date, banana, and plantain palms and the tea and coffee plants take their places in the collection. A pretty feature is a trellis of vines of the granadilla, one of the passion fruit family. Some varieties of fruit trees do well, Japanese plums and persimmons notably; lemons and guavas, peaches and grapes also thrive, but with the last-mentioned unless the fruit is gathered before the rains come it is useless, for with the excess of moisture the berries soon burst. The fruit of the American vine, *Isabella*, however, remains unharmed. Japanese plums thrive splendidly, but insect pests are more than a match for the grower. The dreaded Queensland Fruit Fly has got too firm a hold. Mr.

Bailey had about 10 acres of trees, and it was pitiful to see the fruit, and not a small percentage either, ruined by the pest. The insect is about the size of the common house fly, and is of a brownish colour. It is very nimble, and in the early morning can be seen running about the fruit, the female depositing an egg, or perhaps two eggs, under the skin. The fruits selected are the ones just ripening; the larvæ, hatching in a few hours, commence to eat through the flesh, and all the tissue near their tracks becomes discoloured and putrid in a very brief time. Fruit apparently sound may be picked from the tree one afternoon and next day is unfit for use. The fly is not found in plums only, for apples, pears, persimmons, bananas, and oranges are also within its tastes. But this is not the same fly causing damage in the oranges around Sydney. The southern insect is a smaller species, *Halterophora capitata*; the name of the larger is *Tephritis tryoni*. Notwithstanding its great scope of action the Queensland Fruit Fly is successfully resisted by one kind of plum, namely, the Golden Heart. There must be something in the fruit not to the liking of the pest, for of all the varieties of plums in Mr. Bailey's orchard this was left untouched. Another variety, the Kelsey, can be saved because of its aptitude, uncommon with plums, to ripen in storage. It can be picked when changing colour, and so the Fruit Fly is cheated of its spoil. Another very destructive insect pest is the small beetle, *Monolepta rosea*, called the Peach Ladybird. It moves about in swarms, and attacks both the leaves and the fruit, sucking the nourishment from the leaf and tunnelling into the fruit, which bears the appearance of having been perforated by a charge of shot.

The citrus trees are badly affected by two pests. In spring-time the fat green larvæ of the *Papilio anactus* denude the trees of their young leaves; and the large brown Orange Bug, *Oncoscelis subsiventris*, punctures the fruit, raising unsightly galls on the skin. These large bugs are very common and very disagreeable. When you approach a tree they make helter-skelter for cover, and, like an iguana, keep on the other side of the branch to which you are. The trees of the large yellow guava are stripped in places of leaves by the Case Moth, *Clania lewinii*.

I shall now endeavour to describe more fully what the "Big Scrub" vegetation consists of. There are no eucalypts, for the gum trees were left behind in the forest country, but their places are filled by trees even surpassing them in size. Splendid specimens of the Teak and Mountain Ash are to be seen towering with the Fig and Buoyong trees to some 150 feet or more. The soil is so fertile that these tremendous trees can live and thrive close to each other, while their branches, intertwining, serve as a roof and shade to protect the smaller plants beneath. The scrub may be divided under three heads. Firstly, there are the large trees.

Secondly, the shrubs and the smaller trees, which under the friendly shelter of the larger ones form quite a forest by themselves—a forest within a forest. Under the third head will be put the ground lilies and the creepers, which clothe the scrub floor with their luxuriance. Of the creepers the most plentiful is the palm *Calamus australis*, known as the Lawyer Cane, which is found growing over fallen logs and around the tree trunks and shrubs. The green vegetative part is well covered with spines and thorns, which make the scrub, in places where the Lawyer has become thickly matted together, impassable. Dozens of the tough wire-like canes spring from one root and travel for many yards in all directions before the green portion is reached. It is no uncommon thing for a single cane to measure 200 feet in length, its thickness being not more than $\frac{5}{16}$ of an inch, while the growing portion adds another 30 or 50 feet to the plant. The green stem is protected by a sheath covered with spines; the ribs of the leaf also are armed, while from each joint there springs a tendril some 2 or 3 feet long, armed its whole length with two rows of incurved thorns. This tendril, in the simplest manner possible, catches in your clothing or in your flesh. It is useless attempting to drag yourself free, for the flexible plant will be pulled down on you and more tendrils will hook on. If caught you must stop and free the tendrils one by one. It is by the aid of these appendages that the Lawyer Canes climb among the trees, from where it is sometimes seen hanging in festoons in mid-air. A species of *Tecoma* is also plentiful in the scrub, and is very beautiful when in flower. Its vines spread themselves among the branches of the trees, and the long pliant stems hang like a number of vegetable ropes to the ground, trailing about in fantastic shapes.

(To be continued.)

NOTE ON THE HABITS OF THE MYXOMYCETE— *DIACHÆA ELEGANS*, FRIES.

By D. M'ALPINE, Government Vegetable Pathologist.

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ON 24th April last Mr. C. French, jun., kindly sent me an interesting fungus obtained at Armadale by Mr. W. S. Spence, with the remark that the violets and other plants on which it occurred looked as if someone had spilt candle grease over them, and then the dark heads developed. I determined the fungus to be *Diachæa elegans*, Fr., having been recorded before for Victoria.

It was not, however, recorded for Australia by Lister in his "Monograph of the Mycetozoa," and I sent him a specimen,